

Method of Test For
**DETERMINING THE EFFECT OF MOISTURE ON ASPHALTIC CONCRETE PAVING
MIXTURES**

DOTD DESIGNATION: TR 322-14

Scope

1. This method of test is designed to prepare and test asphaltic concrete specimens to measure the effect of moisture on the tensile strength of the mixture. The potential for moisture damage is indicated by the tensile strength ratio (TSR), expressed as a percent of the tensile strength of a moisture-conditioned set of specimens to that of a control set of specimens. This method of test is used to evaluate lab or plant-produced mixtures to determine conformance with specification requirements during Job Mix Formula (JMF) design, validation, and production. When used for the purpose of JMF validation, this test shall be run on specimens made from plant-produced mix.
2. Reference Documents
 - A. DOTD TR 304 – Determination of Specific Gravity and Density Characteristics of Compressed Asphaltic Mixtures
 - B. DOTD TR 327- Theoretical Maximum Specific Gravity of Asphaltic Concrete Mixtures.
 - C. ASTM D4867 – Effect of Moisture on Asphalt Concrete Paving Mixtures
 - D. DOTD TR 3xx – Asphalt Volumetric Calculations

Apparatus

1. ASTM D4867, Section 5-APPARATUS with the following modifications
 - A. Freezer – a manual-defrosting chest type freezer capable of maintaining a temperature of $-18 \pm 2.0^{\circ}\text{C}$ ($0 \pm 3.6^{\circ}\text{F}$)
 - B. Forms – Worksheet DOTD Form No. 03-22-0732

Health Precautions

Caution is to be exercised when sampling, preparing, and testing asphaltic concrete specimens due to the high temperature of the mix.

Sample

1. Use ASTM D4867, Section 6- PREPARATION OF LABORATORY TEST SPECIMENS or Section 7- PREPARATION OF FIELD SPECIMENS with the following modifications
 - A. Use 100mm (4 in.) diameter specimens for gyratory specimens.
 - B. Laboratory samples are not to be aged and must be compacted to $7 \pm 1.0\%$ air voids.

Procedure

1. Use ASTM D4867, Section 8- PROCEDURE with the following modifications
 - A. Determine the theoretical maximum specific gravity in accordance with DOTD TR 327
 - B. Determine the bulk specific gravity in accordance with DOTD TR 304

- C. Calculate the percent air voids in accordance with DOTD TR 3xx
- D. Freeze-thaw conditioning (ASTM D4867 Note 6) is required.

Report

1. Report the following information:
 - A. Job Mix Formula sequence number and mix code, number of gyrations/weight, plant type, and lot number (when applicable)
 - B. Job Mix Formula maximum theoretical specific gravity, G_{mm}
 - C. Average percent air voids of each set, moisture-conditioned and control
 - D. Average tensile strength of each set, moisture-conditioned and control
 - E. Tensile Strength Ratio, expressed as a percentage

Normal Test Reporting Time

Normal test reporting time is 3 days.